MECHANICAL GENERAL NOTES

(APPLIES TO ALL 'MH' SHEETS)

1. ALL PIPING AND DUCTS IN FINISHED ROOMS OR SPACES SHALL BE CONCEALED IN A FURRED CHASE OR ABOVE THE SUSPENDED CEILING.
2. THE FIRST FIGURE OF DUCT SIZE INDICATES DIMENSION OF FACE SHOWN OR INDICATED. DUCT SIZES ARE NET INSIDE DIMENSIONS.
3. ACCESS PANELS IN HARD SUSPENDED CEILINGS ARE REQUIRED FOR ALL VALVES, TRAPS, DAMPERS, CLEANOUTS, CONTROLS, ETC. ACCESS PANELS SHALL BE FURNISHED AND INSTALLED UNDER THE ARCHITECTURAL SPECIFICATIONS.
4. TOTAL STATIC PRESSURE NOTED IN THE SCHEDULES INCLUDES DUCT SYSTEM, TERMINAL UNITS, FILTERS, COILS, SYSTEM EFFECT, ETC.
5. FOR TYPICAL WATER PIPING CONNECTIONS TO EQUIPMENT, SEE STANDARD EQUIPMENT DETAILS.
6. WATER PIPE CONNECTIONS TO AIR HEATING TERMINAL UNIT COILS SHALL BE MADE TO PROVIDE COUNTER FLOW BETWEEN WATER AND AIR.
7. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATIONS OF CEILING DIFFUSERS, REGISTERS, AND GRILLES.
8. ALL PRESSURES LISTED ARE GAGE PRESSURE UNLESS OTHERWISE NOTED
9. THE SEISMIC RESTRAINT AND ANCHORAGE OF ALL MECHANICAL ELEMENTS INCLUDING EQUIPMENT PIPING, DUCTWORK AND ASSOCIATED APPURTENANCES SHALL BE DESIGNED, FABRICATED, OR OTHERWISE PROVIDED AND INSTALLED BY THE CONTRACTOR IN ACCORDANCE WITH THE IBC.
10. FOR DUCTWORK AND HEATING HOT WATER PIPING INSULATION REQUIREMENTS REFER TO SPECIFICATION SECTION 23 07 11 HVAC AND BOILER PLANT INSULATION.
11. IN THE EVENT OF A DISCREPANCY BETWEEN CONTRACT DRAWINGS AND SPECIFICATIONS. THE MOST STRINGENT SHALL GOVERN.
12. OFFSET ALL RISERS AND DROPS TO AVOID STRUCTURAL ELEMENTS. SEAL ALL PENETRATIONS THRU FLOOR WATERTIGHT.
13. FIELD VERIFY EXACT SIZES, LOCATIONS AND ELEVATIONS OF ALL PIPING AND DUCT CONNECTIONS, OTHER WORK, ETC., AND COORDINATE ALL WORK WITH ALL OTHER TRADES PRIOR TO DEMO OR INSTALLING ANY NEW WORK.
14. SCHEDULE ALL WORK WITH THE FACILITY INCLUDING CONSTRUCTION ACCESS AND STORAGE. THE CONSTRUCTION SCHEDULE PROCEDURE SHALL BE APPROVED BY THE FACILITY PRIOR TO THE START OF CONSTRUCTION.
15. CONTRACTOR SHALL PROVIDE DUST COVERS AS REQUIRED TO CONTAIN DUST AND DEBRIS WITHIN CONSTRUCTION AREA. BROOM CLEAN ALL AREAS EACH DAY. KEEP DIRT AND DUST TO A MINIMUM. COORDINATE ALL MEASURES WITH FACILITY'S INFECTION CONTROL OFFICER.
16. WORK SHALL BE EXECUTED IN A CAREFUL AND ORDERLY MANNER WITH THE LEAST POSSIBLE DISTURBANCE TO PUBLIC AND OCCUPANTS OF THE FACILITY.
17. CONTRACTOR SHALL ASSUME SOLE RESPONSIBILITY FOR SAFETY OF ALL PERSONS ON OR ABOUT THE CONSTRUCTION SITE, IN ACCORDANCE WITH APPLICABLE LAWS AND CODES. GUARD ALL HAZARDS IN ACCORDANCE WITH THE SAFETY PROVISIONS OF THE LATEST MANUAL OF ACCIDENT PREVENTION PUBLISHED BY THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA AND OSHA.
18. INSTALL WALL-MOUNTED ROOM THERMOSTATS 4-FEET ABOVE FINISHED FLOOR UNLESS DIRECTED OTHERWISE. COORDINATE INSTALLATION LOCATION AND HEIGHT WITH ALL TRADES PRIOR TO THERMOSTAT ROUGH-IN.
19. PROVIDE VALVES AND OTHER PIPING SPECIALTIES SAME SIZE AS LINE SIZE UNLESS OTHERWISE NOTED.
20. COORDINATED SHOP DRAWINGS ARE REQUIRED TO AMPLIFY, EXPAND AND COORDINATE THE INFORMATION CONTAINED IN THE CONTRACT DOCUMENTS. APPROVED SHOP DRAWINGS ARE REQUIRED PRIOR TO THE INSTALLATION OF ALL NEW WORK.
21. REFER TO ARCHITECTURAL DESCRIPTION OF CONSTRUCTION PHASING. PROVIDE SEQUENCED DEMOLITION, TEMPORARY SERVICES AND SEQUENCED CONSTRUCTION IN ORDER TO MAINTAIN SERVICES TO OCCUPIED PORTIONS OF THE FACILITY. USE CAUTION WHEN SAW-CUTTING THROUGH EXISTING CONCRETE FLOOR OR WALL CONSTRUCTION FOR THE INSTALLATION OF MECHANICAL/PLUMBING SYSTEMS TO AVOID CUTTING (E) REBAR AT EDGE OF OPENING. LEAVE SUFFICIENT REBAR EXPOSED TO TIE NEW REINFORCING FOR REPLACEMENT CONCRETE AND OR OTHER STRUCTURAL ATTACHMENTS FOR NEW CONSTRUCTION. OBTAIN APPROVAL OF AN OWNER'S REPRESENTATIVE A MINIMUM 72 HOURS PRIOR TO ANY SAW CUTTING OF EXISTING CONCRETE.
22. FURNISH AND INSTALL MANUAL AIR DAMPERS (MAD) AT ALL DUCT BRANCH TAKEOFFS TO A SINGLE SUPPLY DIFFUSER. PROVIDE MAD WITH REMOTE OPERATOR WHERE MAD'S ARE ABOVE GYP BOARD OR OTHER INACCESSIBLE CEILING.
23. FLEXIBLE DUCTWORK CONNECTIONS TO CEILING DIFFUSERS ARE LIMITED, WHERE SHOWN, TO 5'-0" MAXIMUM LENGTH UNLESS SPECIFICALLY SHOWN OTHERWISE.
24. WHERE INLET DUCT DIAMETER AND DIFFUSER NECK SIZE ARE THE SAME (I.E. 9Ø & 9x9) CONTRACTOR SHALL OVERSIZE THE SHEET METAL PLENUM TO ACCOMMODATE THE ROUND DUCT.
25. WHERE INLET DUCT DIMENSION AND DIFFUSER NECK SIZE/SHEET METAL PLENUM DIMENSIONS DO NOT MATCH, CONTRACTOR SHALL FURNISH AND INSTALL REQUIRED TRANSITIONS TO MAKE CONNECTION.
26. ANY MECHANICAL WORK REQUIRING WORK OUTSIDE AREAS OF THE PRIMARY ROOMS WITHIN THE PROJECT SCOPE, INCLUDING BUT NOT LIMITED TO THE CEILING ABOVE, THE FLOOR BELOW THE AFFECTED FLOOR AREA AND SURROUNDING AND ADJOINING AREAS SHALL BE COORDINATED WITH OWNER'S REPRESENTATIVE FOR ACCESS TO OTHER AREAS OF THE BUILDING. TO SCHEDULE WORK, INCLUDING WORKING OFF HOURS, TO PROVIDE NON-INTERUPTION OF THE EXISTING BUILDING ACTIVITIES DURING NORMALLY OCCUPIED HOURS. COORDINATE WITH THE OWNER'S REPRESENTATIVE WELL IN ADVANCE OF ANY REQUIRED SHUT-DOWN OF SYSTEMS AFFECTED BY WORK OF THIS PROJECT.
27. PROVIDE AIR FILTERS FOR ALL OPEN RETURN AND EXHAUST AIR DUCTS ONCE CEILING ARE REMOVED TO AVOID CONTAMINATION. FILTERS TO BE OF SUITABLE EFFICIENCY FOR RELEVANT CONTAMINENTS WITH THE AREA SERVED AND SHALL BE REPLACED ON A WEEKLY BASIS AS NEEDED TO MAINTAIN FILTER EFFICENCY. COORDINATE WITH FACILITY'S INFECTION CONTROL OFFICER. THE MINIMUM EFFICIENCY OF THE FILTERS SHALL BE MERV 8.
28. ALL WORK SHALL CONFORM TO THE 2012 IBC, 2012 IMC AND THE LATEST EDITION OF THE VA DESIGN MANUAL.

AIR TERMINAL UNIT SCHEDULE

MARK	LOCATION	AREA AND/OR ROOM SERVED	AIR HANDLING SYSTEM	SIZE	AIRFLOW CLG CFM	AIRFLOW HTG CFM	AIRFLOW MIN CFM	ADDITIONAL SOUND ATTENUATION	CONTROL TYPE	CONTROL SEQUENCE DETAIL	HOT WATER REHEAT COIL ROWS	HOT WATER REHEAT COIL GPM	HOT WATER REHEAT COIL MBH	REMARKS
101-TU-2-201	ABOVE CEILING	B2-C10 (B2-C11) 1	101-AHU-2	F	795	710	710	NO	VAV	1/MH6.1	2	1.8	30.9	
101-TU-2-202	ABOVE CEILING	B2-148	101-AHU-2	C	230	230	230	NO	CAV	1/MH6.1	2	0.6	9.3	
101-TU-2-203	ABOVE CEILING	A2-120 A2-121	101-AHU-2	H	1870	845	845	NO	VAV	1/MH6.1	2	1.8	30.3	
101-TU-2-204	ABOVE CEILING	B2-142 B2-144 B2-146	101-AHU-2	E	690	410	410	NO	VAV	1/MH6.1	2	0.6	16.2	
101-TU-2-205	ABOVE CEILING	B2-137 B2-139 B2-141	101-AHU-2	F	715	315	315	NO	VAV	1/MH6.1	2	0.6	17.0	
101-TU-2-206	ABOVE CEILING	A2-123 B2-143 B2-145	101-AHU-2	F	735	325	325	NO	VAV	1/MH6.1	2	0.6	18.0	
101-TU-2-208	ABOVE CEILING	A2-125	101-AHU-2	C	245	245	245	NO	CAV	1/MH6.1	2	0.6	8.3	
(E)101-TU-2-209	ABOVE CEILING	A2-100	101-AHU-2	C	365	365	365	NO	VAV	1/MH6.1	2	0.1	14.2	
(E)101-TU-2-211	ABOVE CEILING	A2-103	101-AHU-2	B	115	50	50	NO	VAV	1/MH6.1	2	0.5	5,184.0	
(E)101-TU-2-213	ABOVE CEILING	A2-105 A2-107	101-AHU-2	E	465	465	465	NO	CAV	1/MH6.1	2	0.6	12.6	
101-TU-2-212	ABOVE CEILING	A2-109	101-AHU-2	C	210	95	95	NO	VAV	1/MH6.1	2	0.6	7.7	
101-TU-2-214	ABOVE CEILING	A2-127	101-AHU-4	C	245	110	110	NO	VAV	1/MH6.1	2	0.6	8.3	
101-TU-4-223	ABOVE CEILING	B2-C15	101-AHU-4	B	150	135	135	NO	VAV	1/MH6.1	2	0.6	6.4	
101-TU-4-225	ABOVE CEILING	B2-100	101-AHU-4	G	1225	565	565	NO	VAV	1/MH6.1	2	0.6	12.6	
101-TU-4-226	ABOVE CEILING	B2-101 B2-103 B2-105	101-AHU-4	F	705	305	305	NO	VAV	1/MH6.1	2	0.6	12.6	
101-TU-4-227	ABOVE CEILING	B2-107	101-AHU-4	C	220	95	95	NO	VAV	1/MH6.1	2	0.6	8.0	
101-TU-4-228	ABOVE CEILING	B2-109	101-AHU-4	C	235	105	105	NO	VAV	1/MH6.1	2	0.6	8.0	
101-TU-4-229	ABOVE CEILING	B2-111	101-AHU-4	C	250	110	110	NO	VAV	1/MH6.1	2	0.6	8.3	
101-TU-4-230	ABOVE CEILING	B2-113	101-AHU-4	C	250	250	250	NO	CAV	1/MH6.1	2	0.7	8.7	
101-TU-4-231	ABOVE CEILING	B2-102	101-AHU-4	C	205	115	115	NO	VAV	1/MH6.1	2	0.6	7.7	
101-TU-4-232	ABOVE CEILING	B2-130 1	101-AHU-4	G	960	430	430	NO	VAV	1/MH6.1	2	0.6	13.9	
101-TU-4-233	ABOVE CEILING	B2-115 B2-117	101-AHU-4 101-AHU-4	D	530	240	240	NO	VAV	1/MH6.1	2	0.6	15.0	
101-TU-4-234	ABOVE CEILING	B2-C13	101-AHU-4	D	470	465	465	NO	VAV	1/MH6.1	2	3.3	16.6	
101-TU-4-235	ABOVE CEILING	B2-119	101-AHU-4	E	600	205	205	NO	VAV	1/MH6.1	2	0.6	14.8	
101-TU-4-236	ABOVE CEILING	B2-121 B2-123	101-AHU-4	D	525	235	235	NO	VAV	1/MH6.1	2	0.6	15.2	
101-TU-4-237	ABOVE CEILING	B2-125 B2-127 B2-129	101-AHU-4	F	865	385	385	NO	VAV	1/MH6.1	2	0.6	15.8	
101-TU-4-238	ABOVE CEILING	B2-120 1	101-AHU-4	G	1070	480	480	NO	VAV	1/MH6.1	2	1.1	23.4	
101-TU-4-239	ABOVE CEILING	B2-134 B2-136	101-AHU-4	D	460	270	270	NO	VAV	1/MH6.1	2	0.6	12.2	
101-TU-4-240	ABOVE CEILING	B2-131 B2-133 B2-135	101-AHU-4	F	725	320	320	NO	VAV	1/MH6.1	2	0.6	18.1	
101-TU-4-241	ABOVE CEILING	B2-138 B2-140	101-AHU-4	D	460	275	275	NO	VAV	1/MH6.1	2	0.6	12.4	
101-TU-4-242	ABOVE CEILING	1 B2-132	101-AHU-4	B	140	125	125	NO	VAV	1/MH6.1	2	1.8	30.3	

AIR TERMINAL UNIT SIZING SCHEDULE

SIZE	MIN ALLOWABLE AIR FLOW CFM	MAX ALLOWABLE AIR FLOW CFM	DUCT INLET SIZE IN	MAX APD (NOT INCL. COIL) IN WG	MAXIMUM SOUND POWER LEVEL OCTAVE BANDS @ 1.5" INLET SP 2	3	4	5	6	7	HOT WATER HEATING COIL EAT °F	EWT °F	MIN FLOW GPM	MAX WPD FT	PIPE RUNOUT SIZE TO COIL IN
B	90	200	6	0.20	69	63	59	52	51	47	58	180	0.5	3.0	0.75
C	105	425	7	0.15	70	69	64	60	57	52	58	180	0.7	4.0	0.75
D	150	580	8	0.04	69	70	63	59	56	51	58	180	0.7	4.0	0.75
E	180	700	9	0.07	72	71	63	58	56	52	58	180	1.0	3.0	0.75
F	230	900	10	0.09	73	69	63	59	57	54	58	180	1.5	4.0	0.75
G	350	1300	12	0.06	74	70	65	63	60	55	58	180	1.5	4.0	0.75
H	600	3000	14	0.08	75	70	65	63	60	55	58	180	1.5	4.0	0.75

NOTES:

1. INLET STATIC PRESSURE BASED ON ARI 885-98
2. THIS SCHEDULE TO BE USED WITH THE TERMINAL UNIT SCHEDULES ON SHEET MH0-1.
3. CONTROL SEQUENCE SHALL BE AS INDICATED ON THE AIR TERMINAL UNIT SCHEDULE.
4. REFER TO SINGLE DUCT AIR TERMINAL UNIT SCHEDULE FOR ACTUAL GPM FLOWS

MECHANICAL LEGEND

SYMBOL	ABBREVIATION	DESCRIPTION
—— HWS ——	HWS	HOT WATER SUPPLY PIPING
- - - HWR - - -	HWR	HOT WATER RETURN PIPING

DEMOLITION CONTROL NOTES:

THE AHU-1 DUCT DIFFERENTIAL SENSOR WILL NEED TO BE REMOVED AND RE-INSTALLED A MINIMUM OF 4 WEEKS PRIOR TO ANY DEMOLITION WORK. REFER TO DETAIL 2/MH6.1 FOR REQUIREMENTS

DUCTWORK SYMBOLS

SYMBOLS	DESCRIPTION
	SUPPLY DUCT (UP & DOWN)
	EXHAUST DUCT (UP & DOWN)
	RETURN DUCT (UP & DOWN)
	SUPPLY CEILING DIFFUSER
	EXHAUST CEILING DIFFUSER
	RETURN CEILING DIFFUSER
	SIDE WALL DIFFUSER
	EXHAUST OR RETURN CEILING REGISTER OR GRILLE
	VANED ELBOW & AIR SPLIT TYPE DUCT TAKE-OFF
	VANED ELBOW (PROVIDE ALL SQUARE OR RECTANGULAR ELBOWS WITH VANES EVEN IF SYMBOL IS MISSING)
	VANED ELBOW (SHORT RADIUS)
	STANDARD RADIUS ELBOW
10x8	NEW DUCT (WIDTH x DEPTH)
	LOUVER (LOUVER SPECIFIED IN ARCHITECTURAL SECTION.)
	FLEXIBLE DUCT
	MANUAL SPLITTER DAMPER
45° SUPPLY	STANDARD BRANCH SUPPLY OR RETURN, NO SPLITTER (45° TAP)
45° RETURN	STANDARD BRANCH SUPPLY OR RETURN, NO SPLITTER (45° TAP)
	SQUARE TO ROUND TRANSITION
	DAMPER
F S	FIRE/SMOKE DAMPER
R	INCLINED RISE, IN DIRECTION OF AIR FLOW
D	INCLINED DROP, IN DIRECTION OF AIR FLOW
FD	FIRE DAMPER
	DEMO DUCT
	DEMO REGISTER

DRAWING SYMBOLS

- 2 / MXX.X.X — DETAIL NUMBER / DRAWING NUMBER WHERE DRAWN
- BUILDING NO. WHERE EQUIPMENT IS LOCATED.
- EQUIPMENT ABBREVIATION (SUPPLY FAN)
- 26-SF 3 — SUPPLY FAN NO.3 IN BUILDING NO.26
- TYPICAL UNIT NO.
- X.XX — KEY NOTE ITEM
- FC / 1 — ITEM (FAN COIL UNIT SHOWN) / ITEM NUMBER (FAN COIL UNIT NO.1) OR (-) FOR NO NUMBER
- TU-1-1 — ITEM (TERMINAL UNIT SHOWN) / ITEM NUMBER (TERMINAL UNIT NO.1) / SERVED BY SUPPLY FAN NO.1

LEGEND

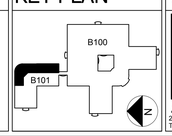
ABBREVIATION	DESCRIPTION
ABV	ABOVE
AF	AFTER FILTER
AFMD	AIR FLOW MEASURING DEVICE
AHU	AIR HANDLING UNIT
APD	AIR PRESSURE DROP, INCHES WATER COLUMN
AV	AIR VENT
AV	ACCUATOR VALVE
BLDG	BUILDING
BTU(H)	BRITISH THERMAL UNITS (PER HOUR)
CAV	CONTROL AIR VOLUME
CC	COOLING COIL
CFM	CUBIC FEET OF AIR FLOW PER MINUTE
CLG	CEILING
CONC	CONCRETE
COND	CONDENSER
CONN	CONNECT OR CONNECTION
CV	CONSTANT VOLUME
ΔP	DIFFERENTIAL PRESSURE SENSOR
Db	DRY BULB TEMPERATURE
°F	DEGREES FAHRENHEIT
DIA	DIAMETER
DN	DOWN
DWGS	DRAWINGS
EA , E/A	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
(E) , EXIST	EXISTING
EER	ENERGY EFFICIENCY RATIO
EF	EXHAUST FAN
EFF	EFFICIENCY
EG	EXHAUST GRILLE
ELEV	ELEVATION
EQ , EQUIP	EQUIPMENT
EWT	ENTERING WATER TEMPERATURE
EXH	EXHAUST
FC , FCU	FAN COIL UNIT
F.C.	FLEX CONNECTION
FLA	FULL LOAD AMPS
FPM	FEET PER MINUTE
F/SDPR	FIRE/SMOKE DAMPER
GA	GAGE
GALV	GALVANIZED
HX , HEX	HEAT EXCHANGER
HP	HEAT PUMP
IN.	INCH(S)
kPa	KILOPASCAL
KW	KILOWATTS
M/A	MAKE UP AIR
MAX	MAXIMUM
MBH	THOUSAND BRITISH THERMAL UNITS PER HOUR
MD	MANUAL AIR DAMPER
MECH	MECHANICAL
MIN.	MINIMUM
NEG	NEGATIVE
(N)	NEW
NEUT	NEUTRAL
N/A	NOT APPLICABLE
NC	NOISE CRITERIA
NO.	NUMBER
OA , OSA , O/A	OUTSIDE AIR
OAL , O/AL	OUTSIDE AIR LOUVER
POC	POINT OF CONNECTION
POD	POWER OPERATED, OPPOSED BLADE DAMPER
POS	POSITIVE
PPD	POWER OPERATED, PARALLEL BLADE DAMPER
QTY	QUANTITY
RA , R/A	RETURN AIR
RF	RETURN FAN
REQ'D	REQUIRED
RG	REGISTER GRILLE
S	SMOKE
SA , S/A	SUPPLY AIR
SA	SOUND ATTENUATING UNIT
SD	SMOKE DAMPER
SEER	SEASONAL ENERGY EFFICIENCY RATIO
SF	SUPPLY FAN
SM	SHEET METAL
SP	STATIC PRESSURE
SPECS	SPECIFICATION
SS	STAINLESS STEEL
T	THERMOSTAT, THERMOMETER
TEMP	TEMPERATURE
TU	TERMINAL UNIT
TYP	TYPICAL
V	VOLT
VAV	VARIABLE AIR VOLUME
VD	VOLUME DAMPER (MANUAL OPPOSED BLADE)
VEL	VELOCITY
VFD	VARIABLE FREQUENCY DRIVE
VLV	VALVE
W	WATTS
W/	WITH
Wb	WET BULB TEMPERATURE
WG	WATER GAUGE

⚠ AMENDMENT NO. 5	5.29.15
Revisions:	Date

CONSULTANTS:

CAPITAL ENGINEERING CONSULTANTS, INC.
RANCHO CORDOVA, CALIFORNIA
CM - IB/TS — PM - DESIGN TEAM
130502.00 — PROJECT NO.
DATE SIGNED: _____

KEY PLAN



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Drawing Title: MECHANICAL LEGENDS, NOTES, ABBREVIATIONS & SCHEDULES
Approved: Project Director
Project Title: Renovate for Medical Offices Building 101 - 2nd Floor
Location: VA Palo Alto, CA
Date: November 7, 2014 — Checked — Drawn
Project Number: 640-13-143P
Building Number: BLDG 101/2ND FLR
Drawing Number: MH0-1 Dwg.-- of --

Office of Facilities Management
Department of Veterans Affairs

VA FORM 08-6231, OCT 1978

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